

AMENDMENTS TO THE SPECIFICATION

Please insert the following paragraph after the title on page 1,
This is a divisional application of U.S. Patent Application Serial No.
09/940,122, filed August 27, 2001.

Please replace paragraph no. 18 with the following amended paragraph:

As shown in Figure 4A, the output gear 15 is mounted to an output shaft 21. The output shaft 21 includes a distal end 22 which features a female splined hole 23. An opposite end of the shaft 21 may be coupled to a part of a fuel injection system such as a fuel injection pump shown schematically at 29.

Please replace paragraph no. 20 with the following amended paragraph:

Referring again to Figure 4A, the connection between the second idler pulley 16 and second idler gear 13 can be the same or similar to the configuration shown in Figure 4A and, hence, a separate drawing is not provided. The second idler pulley 16 is mounted to a second idler pulley shaft. The second idler gear 13 is also mounted to a second idler shaft. The second idler shaft passes through the second idler gear 13 and has a distal end with a splined female hole that receives a splined end of the second idler pulley shaft. The spline connection as illustrated in Figure 4A or a similar connection can be employed. A lubricant fitting is also utilized to provide a supply of lubricant to the spline connection.

Please replace paragraph no. 22 with the following amended paragraph:

Specifically, referring to Figure 4B, a stationary stub shaft 45 is shown. An idler gear 13b is mounted over the shaft 45. The idler gear 13b is equipped with a splined extension 46 which has a splined exterior surface 47 which is connected to a splined interior surface 48 of an idler pulley 16b. A lubricant fitting 25b is shown which enables lubricant to be injected from a supply 26b and between the splined interior surface 49 of the extension 46 and an the splined exterior surface 51 of the stub shaft 45. Communication is provided between the space defined by the interior splined surface 49/exterior splined surface 51 and the interior surface 48/exterior surface 47 by a port 27b thereby providing lubricant to the spline connection between the surfaces 47, 48.

Please replace paragraph no. 23 with the following amended paragraph:

Figure 4C illustrates a gear 15c fixedly mounted to a shaft 21c. A pulley 17c is fixedly mounted to a pulley shaft 24c. The shaft 21c includes a splined hole 23c that terminates at the end wall 28c and which receives a splined portion 52 of a pulley shaft 24c. A stationary bearing sleeve 53 is connected to a lubricant fitting 25c and the port 27c provides communication between a supply 26c, the fitting 25c and the splined connection between the shaft 24c and shaft 21c. The embodiment illustrated in Figure 4C is applicable to a crank shaft, cam shaft and all other devices that utilize journal bearings. The embodiment in Figure 4B is applicable to numerous devices whereby a rotating gear is mounted to a stationary shaft 45. Numerous other arrangements for the placement of the splined connection between the pulley and gear and for the placement of the lubricant fitting, supply port and bleed port will be apparent to those skilled in the art.

Please replace paragraph no. 24 with the following amended paragraph:

Figure 5 illustrates, graphically, the effectiveness of the damping mechanism of the present invention which includes a combination of an endless belt wrapped around pulleys mounted to an output shaft and a second idler shaft and lubricant spline connections between the pulley shafts and the output and idler shafts. Specifically, comparing the graphical lines 35, 36 on the left side of Figure 5, increasing the belt stiffness from at or near zero to a stiffness of about 30 mega Newtons per meter (MN/m) results in a substantial decrease in the mesh torque at the cam or output gear 15 from about 900 Newton meters (Nm) to about 760 Newton meters as shown by line 35.

Please replace paragraph no. 25 with the following amended paragraph:

This dramatic decrease in mesh torque at the output gear 15 results in only a slight increase in mesh torque at the crank or input gear from about 880 Newton meters to about 900 Newton meters as shown by line 36. Thus, an optimum belt stiffness can be found in the range from about 20 mega Newtons per meter to about 30 mega Newtons per meter.

Please replace paragraph no. 26 with the following amended paragraph:

Similarly, on the right side of Figure 5, an increase in the belt damping at the cam or output gear 15, as shown by line 37, results in a decrease in the mesh torque experienced at the output gear 15 but also results in an increase in the mesh torque experienced at the input or crank gear 11 as exemplified by line 38. Thus, depending upon the acceptable mesh torque at the crank gear 11, an optimum belt damping range can be found. If it is desired to keep the mesh torque below 920 Newton meters at the input gear 11, the belt damping should be restricted to a range between 10 and 40 kilo Newtons seconds per meter.